



Is the future blue-green? A review of the current model predictions of how climate change could affect pelagic freshwater cyanobacteria

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Abstract:

There is increasing evidence that recent changes in climate have had an effect on lake phytoplankton communities and it has been suggested that it is likely that Cyanobacteria will increase in relative abundance under the predicted future climate. However, testing such a qualitative prediction is challenging and usually requires some form of numerical computer model. Therefore, the lake modelling literature was reviewed for studies that examined the impact of climate change upon Cyanobacteria. These studies, taken collectively, generally show an increase in relative Cyanobacteria abundance with increasing water temperature, decreased flushing rate and increased nutrient loads. Furthermore, they suggest that whilst the direct effects of climate change on the lakes can change the timing of bloom events and Cyanobacteria abundance, the amount of phytoplankton biomass produced over a year is not enhanced directly by these changes. Also, warmer waters in the spring increased nutrient consumption by the phytoplankton community which in some lakes caused nitrogen limitation later in the year to the advantage of some nitrogen-fixing Cyanobacteria. Finally, it is also possible that an increase in Cyanobacteria dominance of the phytoplankton biomass will lead to poorer energy flow to higher trophic levels due to their relatively poor edibility for zooplankton.

Source: <http://dx.doi.org/10.1016/j.watres.2011.12.018>

Resource Description

Climate Scenario : ☒

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES), Other Climate Scenario

Special Report on Emissions Scenarios (SRES) Scenario: SRES A2

Other Climate Scenario: HADCM2; A2

Exposure : ☒

weather or climate related pathway by which climate change affects health

Food/Water Quality

Food/Water Quality: Biotoxin/Algal Bloom

Geographic Feature: ☒

Climate Change and Human Health Literature Portal



resource focuses on specific type of geography

Freshwater

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease, Neurological Effect, Respiratory Effect, Urologic Effect

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Marine Toxin Syndrome

Respiratory Effect: Bronchitis/Pneumonia

Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Long-Term (>50 years)

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content